THE HEALTH EDUCATION JOURNAL

Vol. X JANUARY 1952 No. 1

	Page
Happy Families	1
Human Biology in the Secondary Modern School	2
The Foundations of Social Life	5
Children's Ideas on the Activity of Germs	15
Films in University Education	21
The Problem of Cancer	27
Milestones in Medicine—17	37
A Chapter of Accidents—Part I	39
Nutrition Commentary	44
Book Reviews	50

THE CENTRAL COUNCIL FOR HEALTH EDUCATION

THE CENTRAL COUNCIL FOR HEALTH EDUCATION

Tavistock House, Tavistock Square, London, W.C.1

Founded 1927 Incorporated 1936

OFFICERS

President: LORD BOYD-ORR, D.S.O., M.C., F.R.S., LL.D.
Vice-Presidents: SIR W. ALLEN DALEY, M.D., F.R.C.P.
CHARLES HILL, M.A., M.D., LL.D., D.P.H., M.P.
Chairman: ALDERMAN W. E. YORKE, C.B.E., J.P.
Vice-Chairman: ALDERMAN G. CANTY.
Honorary Treasurer: J. J. McINTYRE, O.B.E.

Medical Director:
DR. JOHN BURTON

The Central Council for Health Education is a voluntary organisation supported by the Ministry of Health and the Local Authorities for England, Wales and Northern Ireland. Its main purpose is to serve those concerned in Health Education and assist them with advice, information and suitable material, such as publications and exhibitions.

A staff of officers is employed by the Council to provide expert advice to cover each of these principal activities.

The free services comprise lectures and information and advice; the other services comprise exhibition services, publications, summer school and annual seminar.

HEALTH EDUCATION IN SCOTLAND

The Secretary of State for Scotland recognises the Scottish Council for Health Education as the responsible body for assisting Local Authorities in Scotland, and inquiries concerning health education in Scotland should be made to the Secretary and Treasurer, The Scottish Council for Health Education, 3, Castle Street, Edinburgh, 2.

THE

Health Education Journal

A QUARTERLY FOR ALL WHO ARE INTERESTED IN HEALTH

EDITOR
Dr. John Burton

ASSOCIATE EDITOR (NUTRITION)
F. Le Gros Clark

ASSISTANT EDITOR
M. A. Taylor

ADVERTISEMENT AND BUSINESS MANAGER
G. W. Grosse

Vol. X/January 1952/*No.* 1

Articles : Readers are invited to submit articles on Health or Health Education. They should not as a rule be more than 2,000 words long. Contributions should be addressed to the Editor.

Subscription Rates : Single copy, 2/9, post free. Annual Subscription (4 issues), Post free, 10s. Orders to : The Medical Director, Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1. Tel. EUSton 3344.

PLEASE...

Encourage mothers to sterilize babies' feeding bottles and teats, and so combat cross infection that is the cause of so much infant sickness and diarrhoea.

The Milton method of continuous sterilization is used by so many hospitals and clinics nowadays. It leaves no taste in bottles, teats or feed.

For full particulars write to the Chief Bacteriologist, Milton Antiseptic Limited, John Milton House, London, N.7.

ENCOURAGE CONTINUOUS STERILIZATION

OF FEEDING BOTTLES AND TEATS WITH

MILTON

HAPPY FAMILIES

"ALL happy families resemble one another, but each unhappy family is unhappy in its own way." Thus did Leo Tolstoy open his novel *Anna Karenina* and summarise the problem of human relations in a modern society. It seems inevitable among authors and clinicians that it is the things that go wrong which claim the most interest; the tragedy is more attractive than the comedy. It is thus that an immense dramatic and technical literature has grown up dealing with the pathology of family life, but little that is convincing has been said about its physiology.

Against this background a tendency has developed to lay the blame for most of our social difficulties at the door of the family, as if the family were something apart from the society in which it exists and from which it draws its nourishment.

The contemporary unit of father, mother and children is the most primitive type of family organisation which exists and perhaps because of its simplicity it has survived with minor adaptations better than the more complex organisation of polygamy and group marriage. The particular virtues of its simplicity are that it has provided at one and the same time biological security and satisfaction of the economic requirements of societies in which private property and inheritance were paramount.

The fact that it has survived in previous societies does not, however, mean that it is to survive in our own economic climate. Already divorce, multiple marriage and unmarried parenthood have become significant modifications of the primitive family pattern. Never before in human society have men and women been so independent of one another as in the last fifty years. Rarely before has the family unit been so isolated from its society. Never before has the economic cornerstone of marriage been so feeble, and therefore never before has such a strain been put on to the other factors involved in our primitive family pattern.

Because we feel that a profound understanding of the realities underlying contemporary family life is essential if health educators are to be able to help men and women to live more effective lives, we have started a series of articles in which we hope to investigate in some detail the specific factors within and without families which are producing stress or harmony. Centring itself on the family unit, our examination will be directed inwards to individual factors and outwards to an investigation and comparison of contemporary religious and political systems which seek to shape family life in our own and other societies.

Following Dr. Holt's charming and provocative introduction *The Decay of Family Life* in our last issue, we are continuing in this number with Dr. Torrie's review (page 5) of the remarkable report *Maternal Care and Mental Health* prepared by Dr. John Bowlby for the W.H.O. Here for the first time we are presented with massive evidence of those specific factors in human affairs which are essential to the growth of " the affections " and the lack of which leads a home to be called " broken."

If the humane and reasonable implications of this report are grasped and used, Preventive Medicine and Health Education may again leap forward, armed with a weapon more potent than the laboratory wonders and whose target is no less than the innermost circles of human nature.

HUMAN BIOLOGY IN THE SECONDARY MODERN SCHOOL*

By H. G. TUCHLER, *Cottesmore Secondary School, Nottingham.*

IT is generally recognised that teaching should be as closely related to the children's life and experience as possible. This applies particularly to the Secondary Modern Schools which—catering as they do for the majority of the boys and girls between 11 and 15 years of age—aim at a broad education, and usually prepare only a small number of their pupils for external examinations. But while great progress has been made in many subjects, some biology teachers still do not acknowledge that a study of the human body is one of the best means for the study of life. Flowers, one-celled creatures, animals: they all may be discussed with profit, but the most direct link between the phenomena of life and the experiences of the children is provided by human biology.

The Approach

Few teachers deny the need for a course on the human body, in principle. The main excuse for excluding human anatomy and physiology, however, is that the study of the body turns out to be too difficult, except for those pupils who give a great proportion of their time to it. Now it is quite true that a strictly scientific approach would be too complicated for many children—but such an approach is not really necessary. Very good results can be achieved by methods which are livelier and more popular though they still, of course, drive home the essential principles.

As an example let us consider a series of lessons on, say, blood. An outline of the vascular system, followed by a discussion of the heart and rounded off by a table setting out the function of the various corpuscles may be logical enough and possibly advisable in studies for an examination —but would almost certainly be too theoretical for lively youngsters. The matter looks different when the teacher comes into the classroom with a secretive face, asks for volunteers " who can stand pain," selects one (the whole form will probably have volunteered), pricks the " hero's " finger with a pin and finally takes from him a sample of blood in which the movement of the red cells can be seen under a microscope. The teacher

Reprinted from* **The Schoolmaster.

may perhaps carry on by letting the members of the class measure their pulse rate before and after exercise; next, he might demonstrate the change of dark red into bright red blood and back—shaking the sample of blood will do for the first process, blowing carbon dioxide through it for the second one. The function of the white cells can be made into a thrilling adventure story about invading germ-soldiers and defending tank-corpuscles which make prisoners of the invaders; here the achievements of Pasteur and Lister may conveniently be discussed as well. The whole series of lessons could be clinched by a visit to a blood transfusion centre or a clinic. Similarly, a course on digestion may be enlivened i.a. by the dissection of small animals and by chemical experiments on various foods (e.g. Fehling's test or the change of starch into sugar by means of saliva.)

The presentation of the subject matter in the manner indicated may not be quite easy for conventionalists at first, since it demands a certain amount of imagination and a constant readiness to experiment. The difficulties, however, are by no means insuperable: a working knowledge of the salient facts, a good grounding in educational principles and an understanding of the class are all that are needed—and which teacher could hope to do well on any topic without these ?

Creation of Attitude

It is hard to conceive how courses on such subjects as hygiene or first aid can be held without an appropriate foundation in human anatomy and physiology. But more important even than factual knowledge is the attitude created. Many children tend to faint at the sight of injuries, or feel disgust at their " insides "—if left in that frame of mind they may develop into unco-operative patients in case of illness or even, by building up shame and fear complexes, into neurotics. It does not need reproof or ridicule to destroy such an unsound outlook; a cool, detached, matter-of-fact approach in a course on the human body will probably transfer itself to the majority of the pupils, and may sway their attitude for ever.

Sex Education

Somewhere in the course on anatomy and physiology the discussion of sex should be included. In no other field does one find such ignorance of facts, such prejudiced opinions, warped ideas and even superstitious beliefs, as here. Enlightenment cannot come, however, out of a vacuum—a series of lectures without reference to the other functions of the body may do more harm than good, particularly if given by outsiders. Sex education should be built systematically into anatomy and physiology; there is nothing unusual in talking about testes and ovaries if one has previously described lungs and kidneys, and there is no sense of speciality

in the discussion of sex behaviour if it is preceded by a consideration of e.g. clean food habits. I once answered a few questions of my class of 15-year-old school leavers on health matters. They had had sex education two years earlier and, naturally, a few points of sex behaviour came up amongst other things. Nobody in the whole class of 40 or so boys took any particular notice—except two lads who grinned continuously. At last I asked them: " What are you so excited about? Haven't you heard all that in the second year ? " Upon that the explanation of their nervousness came at last: " No, Sir," was the reply, " we were not in this school then."

Summary

Lessons on human biology are one of the best means of linking the fundamental phenomena of life with the experience of growing boys and girls. Such lessons, if tackled with some thought and imagination, need not be too difficult even for average pupils without special ability in science, nor do they demand unattainable standards or efforts from teachers. The advantages of a course of this kind are mainly twofold: it provides essential information and encourages a positive attitude to matters of health—thus, a course in biology represents part of the important compromise, so eagerly sought in education, between factual instruction and guidance in the development of the children's personalities.

BIOGRAPHICAL NOTES

H. G. TUCHLER—Born at Vienna, and studied medicine at the University at Vienna until the invasion of Austria. Served in the British army for four years, and became British by naturalisation. Is now a teacher and has seven years' experience specialising in biology and sex education.

ALFRED TORRIE, M.A., M.B., Ch.B., D.P.M.—Medical Superintendent, The Retreat, York; member of Ministry of Education Committee on Maladjusted Children. Formerly Medical Director, National Association for Mental Health; Director of Army Psychiatry; Consultant Psychiatrist, Tavistock Clinic.

THE FOUNDATIONS OF SOCIAL LIFE

By ALFRED TORRIE, M.A., M.B., Ch.B., D.P.M., *Medical Superintendent, The Retreat, York.*

THE uncharted field of the human personality still attracts many students of mental health. The schools of psychology grow in number. There seems to be no diminution in the flow of patients in distress of mind seeking help in mental hospitals and in their out-patient departments. The incidence of mental ill health remains the same. Dr. Russell Fraser and a team of research workers proved in 1943 that about one third of industrial workers suffered from a minor degree of mental sickness. In 1733 Dr. George Cheyne published a book called *The English Malady* in which he pointed out that nervous disorders were " computed to make almost one-third of the complaints of the people of condition in England." It is a strange fact that the results of treatment have also been the same. Figures of the follow-up studies from places as widely different as the Institute of Psycho-Analysis in Chicago, the Cassel Hospital, The Tavistock Clinic, and the Maudsley Hospital, show that about two out of three benefit by treatment, even though the type of treatment varies widely.

If a third of all illness is due to mental ill health, then it is about time that public health workers turned their attention to the aspects of prevention of this great social disorder. It is understandable that they have been bewildered by the complexity of the subject. So many voices have suggested so many different remedies. The genetic school in this country has been most vocal in insisting that mental instability is an inherited disorder. The environmentalists, on the other hand, have gone to the other extreme and claimed that influences in the social setting of the individual are mainly responsible for his breakdown. The constitutionalist or organicist accordingly claims that mental sickness is "bred in the bone." Those who uphold nurture versus nature claim that given the right conditions the individual will grow up normally. Others, like the present writer feel that the causes are both constitutional and environmental.

The most important book on the origins of mental ill-health which I

have recently read is John Bowlby's *Maternal Care and Mental Health.** Bowlby is a consultant in mental health to the World Health Organisation, and also Director of the Child Guidance Department in the Tavistock Clinic, London. His book provides a good answer to the wholly nature and nothing of nurture school. The study was the result of a three months' tour of Europe and North America for the W.H.O. with the purpose of gathering evidence to help in the care of " children who are orphaned or separated from their families for other reasons, and need care in foster homes, institutions or other types of group care." These words are an extract from a decision made at the third session of the Social Commission of the United Nations, held in April 1948, when it was decided to make a study of the needs of homeless children. Bowlby's hypothesis was that maternal deprivation had adverse effects. Some people may criticise him for starting off with this hypothesis, instead of collecting his facts first, but this type of research has been looked upon as perfectly valid by many reputable authorities. Part I of the book is headed "Adverse Effects of Maternal Deprivation." Part II is headed " Prevention of Maternal Deprivation." The latter part contains much of interest to the public health worker. There are four Appendices giving tables on studies relating to mental illness in children, statistics and explanations of the results of special psychometric tests. There is a bibliography of one hundred and fifty-nine references, and this for completeness and up-to-dateness could scarcely be improved upon. The book is also available in French in the Monograph Series of the World Health Organisation.

That Bowlby does not ignore constitutional and endogenous factors is shown by his use of the statistical methods so beloved of the students of inherited factors. The book is well peppered with percentages and phrases like " statistically significant," " P is less than ·01, which means that there is less than one chance in a hundred that the result is due to chance." Up to now no clinical psychiatrist or student of the complex field of human behaviour has given results which can be compared with those of the workers who emphasise so much the materialist point of view. In addition Bowlby quite rightly says that the inherited or constitutional factor must not be omitted, but taken fully into account.

He divides his study into three parts. He reviews work done by the direct observation of the mental health and development of children in institutions, hospitals and foster homes—direct studies. Secondly, he summarises studies which investigate the early histories of adolescents or adults who have developed psychological illness, and calls these retrospective studies. Lastly he describes studies which follow up groups of children who have suffered deprivation in their early life, with a view to determining their

*Published by the *World Health Organisation.*
Price 10s. from H.M. Stationery Office.

state of mental health—follow-up studies. The direct studies are the most numerous. They make it quite clear that when deprived of maternal care, the child's development is almost always retarded—physically, intellectually, and socially, and that the symptoms of physical and mental illness may appear. He goes on to say, " such evidence is disquieting but sceptics may question whether the retardation is permanent, and whether the symptoms of illness may not easily be overcome. The retrospective and follow-up studies make it clear that such optimism is not always justified, and that some children are gravely damaged for life. This is a sombre conclusion which must now be regarded as established." He is well aware of the limitations of his work. He quite frankly says that it is still by no means clear why some children succumb and some do not. He gives the hereditary factor its proper place when he says, " it may be that hereditary factors play a part, but, before resorting to a principle which has been so readily invoked as a solution of biological problems, it is important to review what is known of the effects of such factors as the child's age, and the length, and especially the degree, of deprivation, each of which there is reason to think vital."

So that the well known bias against psychiatrists should not distort the reception of his work, he quotes several " proper doctors " such as paediatricians. He says that Bakwin and Ribble found that " infants under six months of age who have been in an institution for some time present a well-defined picture. The outstanding features are listlessness, emaciation and pallor, relative immobility, quietness, unresponsiveness to stimuli like a smile or a coo, indifferent appetite, failure to gain weight properly despite the ingestion of diets which, in the home, are entirely adequate, frequent stools, poor sleep, an appearance of unhappiness, proneness to febrile episodes, absence of sucking habits." These changes may be seen within a few days of the baby's separation from his mother. The failure of such babies to smile at the sight of a human face has been confirmed experimentally by many other workers.

Development Quotient

Fortunately a test has been devised to ascertain the deteriorating effects of institutional care. The test is called the Development Quotient. This is calculated in a way similar to the Intelligence Quotient and is concerned with general physical and mental development of which intelligence is only a part. A D.Q. of 90 to 110 represents average development. After three months, differences steadily increase between children in institutions and normal children under the care of their mothers or their mother substitutes, so that the children who have been institutionalised for more than eight months during the first year of their lives show such severe psychiatric disturbances that they cannot be tested.

Two workers, Spitz and Wolf, using the same tests, have recently made a systematic study of the adverse effects which occur during the first year of institutional care. They studied altogether four groups of children, in three of which the babies were with their mothers, and one where they were not. Though the absolute levels of development, not unexpectedly, differed according to the social group the babies came from, there was no change of quotient during the year in the case of the babies (one hundred and three in all) who lived with their mothers. The group of sixty-one brought up in an hygienic institution, on the other hand showed a catastrophic drop of Development Quotient between the ages of four and twelve months. At the earlier age the average D.Q. of this group was 124 and second in magnitude of the four groups. By twelve months it had sunk to 72 and was by far the lowest. By the end of the second year it was only 45. The last two figures indicate grave retardation. Later work shows that most of the drop in D.Q. has taken place during the first six months of life. A similar drop in the Intelligence Quotient takes place. This is a remarkable finding and should revolutionise our attitude to mental deficiency, at least to many of the cases, because up to now we have thought that problem families produced mental defectives and have never dreamt that mental defectives in many cases suffered from their disability because of a lack of the emotional food that is so necessary for normal personality development.

Bowlby again recognises the hereditary factor; he calls attention to the fact that it might be said that many children in institutions are born of parents of poor stock, physically, and mentally, and that heredity alone might well account for all the differences. Those who advance this objection, he points out, do not seem to be aware that in the majority of the studies quoted care has been taken by the investigators to ensure that the control groups, brought up either in their own homes or in foster homes, are of a similar social class, and as nearly as possible sprung from similar stock. In addition, he quotes certain studies of identical twins. Experimental separation of a twin goat kid from its mother and the application of a stimulus known to create anxiety in goats, namely periodic extinguishing of lights, produced different behaviour in the twins. The one with the mother was at ease and moved around freely; the isolated one remained cowed in a corner. In fact in one of the experiments the isolated one discontinued suckling from the mother, and because the experimenters were unaware of this and so unable to help, the animal died of dehydration after a few days. This is a fairly clear demonstration of the effects of maternal deprivation on the mammalian young. Further evidence is shown by the fact that even if the child remains in the same institution, extra mothering from a substitute mother will diminish the ill effects. By a substitute mother, of course, he does

not mean one-seventh of a substitute mother, one-seventh of the attention of a nurse. A study done twenty years ago by Daniels, who investigated two groups of two-year-olds living in the same institution, discovered that when one group was given very little tenderness, although adequately cared for in every material respect, they became mentally and physically retarded in comparison with the second, where a nurse was assigned to each child and there was no lack of tenderness and affection.

Several other studies of a similar nature are quoted. Those who are interested in the subject will see verification in the film *Grief in Infancy* which can easily be obtained from the Director of the Cassel Hospital, Nr. Richmond, Surrey. The amazing fact is that separation from the mother from the age of three to six months gives rise to consequences which are insidious in development and much less easily reversed by restoration to the mother. The usual argument is that they are so young that they do not know what is happening to them. The reverse is the case; they are so undeveloped that any effect on the development is permanent in many cases. We are willing to believe this in the case of embryology, namely that rubella at the age of eight weeks has a permanent effect on the fœtus in the uterus. Dog lovers are willing to believe that a sporting dog should be trained by one master and will deteriorate if changed. The Anglo-Saxon mind seems incapable of thinking of its own offspring as susceptible to similar changes.

Bowlby goes on to say that from three to five vulnerability to maternal deprivation is still serious, though much less so. During this period children no longer live exclusively in the present, and can concentrate and see dimly a time when their mothers will return, which is beyond the capacity of most children younger than three. Even up to the age of seven a fair proportion of children are unable to adjust satisfactorily to separation, especially if it is sudden and there has been no preparation. This especially applies to removal to hospital. We in England have had much experience of sudden separation during the evacuation of the children from cities at the time of the war. Many case histories are available of children whose mental ill health has either developed or has been made worse by separation from the mother. Other studies prove conclusively that the present system of admitting young children to hospital is fraught with grave results. One striking case is of a girl of six and three-quarters, who, when being sent to a fever hospital in her third year, cried "I will be a good girl—don't send me." On returning home she was very quiet and sat scared in a corner much of the time. Though she never talked of this experience she would play elaborate hospital games with her dolls, in which sending them away to hospital was a punishment for naughtiness. The evil effects of evacuation are mentioned in the British Ministry of Health Survey, published in 1948, *Children and the British Government*

Evacuation Scheme.

Social Effects of Deprivation

Many workers have demonstrated that children who commit numerous delinquencies, and who seem to have no feelings for anyone are difficult to treat. They are found to have grossly disturbed relationships with their mother in their early years and persistently steal, are aggressive, egotistical, commit sexual misdemeanours, and have a history of maternal deprivation. Each worker shows conclusively the child's inability to make relationships and puts this down as the central feature from which all other disturbances spring. Of this anti-social child, Bowlby said, quoting a work of his own, " Prolonged breaks in the mother-child relationship during the first three years of life leave a characteristic impression on the child's personality. Clinically such children appear emotionally withdrawn and isolated. They fail to develop libidinal ties with other children, and consequently have no friendships worth the name. It is true that they are sometimes sociable in a superficial sense, but if this is scrutinised we find that there are no feelings or roots in these relationships. This, I think, more than anything else, is the cause of their hard-boiledness. Parents and schoolteachers complain that nothing you say or do has any effect on the child. If you thrash him he cries for a bit, but there is no emotional response to being out of favour, such as is normal to the ordinary child. It appears to be of no essential consequence to these lost souls whether they are in favour or not. Since they are unable to make any emotional relationships, the condition of a relationship at a given moment lacks all significance for them."

Of course it may be objected that some children have similar conditions and do not develop abnormally. This comparison is taken care of by a worker called Goldfarb, who planned his work to test the hypothesis that the experience of living in the highly impersonal surroundings of an institution or nursery for the first two or three years of life had an adverse effect on personality development. He selected his samples so that as far as possible they were similar in heredity, and thereby controlled a variable which has been the bugbear of most other investigators. He did three main studies; in each he compared the mental development of children brought up until the age of about three in an institution and then placed in foster homes, with others who had gone straight from their mothers to foster homes in which they had remained. In both samples the children had been handed over by their mothers in infancy, usually within the first nine months of life. The sample most thoroughly studied consisted of fifteen pairs of children who, at the time of examination, ranged in age from ten to fourteen years. One set of fifteen was in an institution from about six months of age to three and a

half years, the other set had not had this experience. Conditions in the institution conformed to the highest standards of physical hygiene but lacked the elementary essentials of mental hygiene. Babies below the age of nine months were each kept in their own little cubicles to prevent the spread of epidemic infections. Their only contact with adults occurred during the few hurried moments when they were dressed, changed or fed by nurses. Later these children were members of a group of fifteen or twenty under the supervision of one nurse who had neither the training nor the time to offer them love or attention. As a result they live " in almost complete social isolation during the first year of life," and their experience in the succeeding two years was only slightly richer.

Goldfarb has gone to great pains to ensure that the foster homes of the two groups are similar in respect of all observable criteria, and demonstrates further that in respect of the mothers' occupational, educational, and mental status, the institution group was slightly superior to the control. Any differences in the mental states of the two groups of children are, therefore, virtually certain to be the result of their differing experiences in infancy. There was in the children who had spent their first three years in an institution a great drop in intellectual ability and Development Quotient. The retardation of the institutionalised children or toddlers persists.

These studies have been confirmed again and again. The conclusions are: Mental ill health is produced (1) by lack of any opportunity for forming an attachment to a mother figure during the first three years; (2) by deprivation for a limited period—at least three months and probably more than six during the first three or four years; (3) by changes from one mother figure to another during the same period.

What can we do about it?

Part II of the book gives some possible solutions. The most interesting chapter is on the " purpose of the family " and the causes of family failure in Western communities. Bowlby goes on to give suggestions for the prevention of family failure. Socio-economic aid is one of the prime essentials. He quotes the League of Nations report that " it may therefore be regarded as an axiomatic principle of child care that no child should be moved from the care of an otherwise competent person if the granting of material aid would make such removal unnecessary." This was published in 1938. Yet nowadays grandiose schemes for building institutions still exist and the taking over of manor houses as institutions for maladjusted children is thought to be a fine piece of social medicine. There are local authorities who are willing to spend up to eight pounds a week to keep a child in a home, but unwilling to spend thirty shillings or so on bedding to enable a child to live at home. Widowed fathers of children under five need assistance in the way of home helps or

other domestic workers, such as a housekeeper. Care of the physical health of the parents of children is another factor to which attention must be paid. Mrs. Eva Hubback's report makes this clear.

Another service for parents is that of marriage guidance. It is still in the embryo stage, and in this country is very little supported by the orthodox medical profession. The marriage guidance movement can study the causes of marriage failure which have such an effect on children. There is great ignorance of the physical side of marriage and of sex technique. But of more importance than this is the personality of the partners. Too much emphasis has been laid on the sexual difficulties, important as they are. The immature personality makes difficult parents. They have carried over unresolved childhood problems into the marriage to an extensive degree. They need attention. Every social worker should know of the strong unconscious drives which lead husbands and wives to create the very problems of which they complain and of the distorted light in which they see the behaviour of their spouse. As A. T. M. Wilson says, " husbands and wives seek within the family the satisfaction of personal and social needs which are by their nature impossible to satisfy there. In these circumstances the family ties are, as it were, 'carrying an amount of current' for which they are not designed and it is not surprising that what corresponds to ' fusing ' is a not infrequent occurrence." Marriage guidance to be effective must therefore take account of broad sociological factors and internal psychological ones. In this connection it is interesting to know that last year, the marriage guidance movement had the advice of eighty-nine different psychiatrists.

The educational arrangements for maladjusted children provide day schools to which children are referred by the mental health section of the school health service and are warmly recommended. Only two local authorities in this country have started this most excellent preventive service. Bowlby makes a surprising defence of boarding schools. He says it removes the maladjusted child from the tensions which produces difficulties if the home conditions are bad. With this I agree. He goes on, however, to say that it has a great advantage of preserving the child's all important home ties, even in a slightly attenuated form. I should have thought that the emotionally disturbed child needed more home ties. He defends this by saying it is a part of the social pattern of most Western communities today and that a child that goes to boarding school will not feel different from other children. This is special pleading for the better-off section of the community. How lucky they are, he points out, that by relieving the parents of their children for most of the year, boarding schools make it possible for some of those to develop more favourable attitudes towards their children during the remainder. From my point of view the segregation of the sexes in boarding schools

favours patriarchal and male dominated attitudes, and many matrimonial difficulties result from inability to look on the spouse as an equal partner in marriage.

Of course there is no easy solution for the emotional instability of those children deprived of early maternal care. One authority, Querido, says that there are three groups:—(1) those which, provided economic and medical help can be given, can become once again effective social units; (2) those which may require some degree of permanent help, but which can respond favourably to it; (3) those which all ordinary social measures are powerless to assist.

The greatest problem, as every public health officer knows, is the family where the failure is due to the psychopathy of the parents. This is a problem that defeats the psychiatrists. One suggestion is to place whole families under supervision by providing for them special units, each of which could accommodate a small number of problem families and which would be the responsibility of trained workers. It is well argued that, for the sake of their own well-being and the well-being of others, the placing under supervision of individuals who are mentally ill is parallel to supervising those who are physically ill and a danger to the community. The isolation of small-pox contacts is an example. The objection that this would involve a serious infringement of personal liberty and offer the possibility of abuse is not raised in connection with the isolation of small-pox, at least it was not during the Brighton epidemic. This of course is temporary until more effective measures for rehabilitating psychopathic characters can be found, or until long term measures of mental hygiene have proved successful in preventing their development.

Long Term Measures of Mental Hygiene.

As the expert committee on mental health of the World Health Organisation says, it is desirable to concentrate especially on the therapeutic and preventive psychiatry of childhood. This means not only treating children but giving psychiatric help to parents, especially the parents of very young children who are in a plastic phase of emotional development and who therefore respond rapidly. Since the need for psychotherapy vastly outstrips the supply, and an order of priority is unavoidable if rational use is made of what exists, pride of place must go to patients who respond in a quick and lasting way. Those who have worked with the parents, especially the mothers, of young children believe that there is no more fruitful mental hygiene work than this. In other words, the long term programme of mental hygiene is the psychiatric care of individual families.

Other Preventive Measures

Bowlby discusses illegitimacy in connection with maternal deprivation

and the provision of substitute families by adoption and by boarding homes. These chapters make recommendations that are in keeping with the research finding. The main principle is that it is essential for the mental health of the child that the infant and young child should experience a warm intimate, and continuous relationship with his mother (or permanent mother substitute) in which both find satisfaction and enjoyment. Given this relationship, the emotions of anxiety and guilt, which in excess characterise mental ill health, will develop in a moderate and organised way. Bowlby comes down heavily on the side of foster-home care as against that of institutional care. He does make one point that sometimes institutional care is necessary, but it must be that of a small specialised institution. He prefers that they should be called " treatment units " to emphasise the fact that the child is sick.

I am afraid the greatest opposition to the advance in mental health comes from the medical profession itself. Most of them, having decided that there is no organic disability, feel that the symptoms are imaginary and are under the control of the individual, that he is suffering from a weak will, or " bloody mindedness " and needs a " kick in the pants." I used to feel this myself. For ten years I was a general physician and felt that those suffering from mental ill health were a confounded nuisance, until I began to realise that they were ill and a challenge to my lack of knowledge.

The Challenge to the Public Health Worker

Bowlby's concluding words cannot be improved on: To those charged with preventive action the present position may be likened to that facing their predecessors responsible for the public health a century ago. Theirs was a great opportunity for ridding their country of dirt-borne diseases; some took it, others remained hypercritical of the evidence and inapt. True, the evidence presented in this report is at many points faulty, many gaps remain unfilled and critical information is often missing; but it must be remembered that evidence is never complete, that knowledge or truth is always partial, and that to await certainty is to await Eternity. It is to be hoped that all over the world men and women in public life will recognise the relation of mental health to maternal care, and will seize their opportunity for promoting courageous and far-reaching reforms.

CHILDREN'S IDEAS ON THE ACTIVITY OF GERMS

By MARIA H. NAGY, Ph.D.,
Associate Professor of Psychology, Lynchburg College, Virginia, U.S.A.

Problem aud Method

IT seemed worth while to investigate the ideas that children have about the activity of germs for, so far as the present author is aware, no psychological research had previously been carried out on the subject. One group test in school classes at Bristol, England, during the year 1949/50 served the purpose. In addition to asking the children to state their name, age and grade, the form contained the following instructions: " We know you like answering questions. Would you answer one for us? This is not school work, and your writing and spelling will not be corrected. Do not ask anything, and work on your own. We shall enjoy all you write. The question is: How do germs work in our bodies? "

Teachers administered the test and did not allow any questions to be asked on the subject. The time given was thirty minutes. It was important

TABLE 1

Average chronological ages Number of Children: 275

Age Range	*Group A*		*Group B*		*Total*	
	No. of children	*Average age*	*No. of children*	*Average age*	*No. of children*	*Average age*
7.0— 7.11	—	—	25	7.8	25	7.8
8.0— 8.11	50	8.6	25	8.7	75	8.7
9.0— 9.11	50	9.6	25	9.6	75	9.6
10.0—10.11	50	10.5	25	10.5	75	10.5
11.0—11.11	—	—	25	11.2	25	11.2
	150		125		275	

that " spontaneous " ideas should be obtained in view of the preliminary nature of the investigation. All the children were from the same school, with a good average mental level and cultural background. Group A consisted of boys and girls in equal number, and Group B was composed, without regard to sex, from the children left over from Group A. The number of children and the average chronological ages may be seen in Table 1.

Results

As the results did not show any characteristic difference in relation to chronological age or sex, the statistical tables were compiled without regard to these factors.

Concerning the activity of germs in the human body, three phases may be distinguished, namely entry into the body, work in the body and exit from the body. Table 2 shows that children within this age range dealt with all three questions, but in different proportion.

TABLE 2

Numbers and percentages of children who dealt with the various phases of the activity of germs in the body.

Group A: 150 children. Group B: 125 children

Phase of germ activity	*Group A*		*Group B*		*Total*	
	No.	%	*No.*	%	*No.*	%
Entrance to body	123	82·0	71	56·8	194	70·5
Work in body ..	79	52·6	75	60·0	154	56·0
Exit from body	39	26·0	5	4·0	44	16·0

Only a small proportion (16%) of the answers considered the exit of germs from the body, and this question is not analysed in detail in respect of the present material.

The children distinguished two main methods by which germs may gain entrance to the body, i.e. in the course of breathing and of eating. (See Table 3).

TABLE 3

Entry of germs into the body. Number of items: 223

Entry by	*Group A*		*Group B*		*Totals*	
	No.	*%*	*No.*	*%*	*No.*	*%*
Breathing ..	74	55·2	45	50·6	119	53·4
Eating ..	54	40·3	38	42·7	90	41·2
Miscellaneous	6	4·5	6	6·7	12	5·4
	134	100·0	89	100·0	223	100·0

As these bodily functions cannot easily be identified with specific organs, it seemed necessary to make another classification according to the organs. Table 4 shows that three organs that carry germs into the body by breathing were mentioned: the mouth, the nose and the skin.

Since the mouth may carry infection through both breathing and eating, Table 5 was compiled to show the dispersion of answers irrespective of the functions of the organs mentioned. It will be seen that the mouth has predominance.

TABLE 4

Respiratory organs carrying the germs. Number of items: 126

	Group A		*Group B*		*Totals*	
	No.	*%*	*No.*	*%*	*No.*	*%*
Mouth.. ..	31	35·2	20	52·6	51	40·5
Nose	38	43·2	12	31·6	50	39·7
Skin	19	21·6	6	15·8	25	19·8
	88	100·0	38	100·0	126	100·0

TABLE 5

Organs carrying germs into the body. Number of items: 207

	Group A		*Group B*		*Totals*	
	No.	%	*No.*	%	*No.*	%
Mouth.. ..	79	58·1	53	74·6	132	63·8
Nose	38	27·9	12	16·9	50	24·1
Skin	19	14·0	6	8·5	25	12·1
	136	100·0	71	100·0	207	100.0

As for the activity of germs inside the body, there were eight classes of answer. (Table 6.) According to the first class germs attack the organism in some way; they " upset," " disturb." Reasons for this were not often given. The second class supposed that germs hinder some function: " stuff up the pores", "block the blood circulation." The third class said that germs give the body pain, sometimes enough to kill it. According to the fourth class of answers, the entry of germs poisons the body, but the circumstances of poisoning were not detailed. The fifth class said that germs make trouble in the body by moving in it. Such items as " crawl," " jump," " go round," " walk," " travel," make up this class. According to the sixth class germs feed on the body; they eat the bones away, suck out the blood. The seventh class attributed illness to the fact that germs breed in the body and reproduce themselves. For further illustration of these classes here are some verbatim examples:—

1. W.P. (9.11, boy): " The germs in our body are working all the time to get out through the pores of our skin and some go in through the pores. We sometimes let germs in through our mouth, because when we breathe through our mouth we breathe in germs. When the germs get into our bodies they lay eggs. Germs are carried by animals as well as people."
2. K. P. (9.7, girl): " They eat our flesh and drink our blood and they take anything out of us. They are very harmful. They are the cause of the illnesses we get. When we may be talking to somebody they might cough and so the germs might come to us.

They creep about in our bodies interfering with our bones and skin."

3. D.M. (9.3, girl): " Germs are very little black and white things. They work in gangs. One gang is for the nails, another for the teeth and another for illnesses. That is why you must breathe through your nose, for in your nose are long black hairs and if a germ went up your nose it would get stuck and die but if you breathe through your mouth you have to open it sometimes and then a germ gets in."
4. V. C. (9.9, girl). " They eat our blood and sometimes they eat our flesh and bones, and gradually they creep up our body and make our temperatures high. They are very harmful creatures and they give you bad illnesses like Paralysis....."

TABLE 6

Activities of germs in the body. Number of items: 122

	No.	%
Attacking ..	15	12·3
Blocking ..	12	9·8
Giving Pain ..	7	5·7
Poisoning ..	18	14·8
Moving	30	24·6
Eating	24	19·7
Breeding ..	13	10·7
Miscellaneous ..	3	2·4
	122	100·0

Summary and Discussion

1. During the session 1949/50, 275 children from one junior school in Bristol, within the age range 7.0-11.11, were tested in groups concerning their ideas on the activities of germs in the human body.
2. Two functions in particular were mentioned as carrying infection

into the body: breathing and eating. The mouth, the nose and the skin were considered to be the respiratory organs carrying infection.

3. The mouth was considered the principal organ transferring infection into the body, through breathing and eating. This would indicate that children at this chronological age, in a proportion of 64% hold a theory of oral infection. The point seems worth investigating further.

4. As well as the entrance of germs into the body, the children also dealt with the activity of germs inside the body. Their ideas on this problem covered a wide field, in which two main trends may be distinguished: first, germs were thought to interfere with the body by upsetting or even stopping its regular functioning; secondly, germs affect the organism by living from it.

5. A proportion of under 20% of the answers dealt with the way in which germs leave the body. This means that their entry into the body and activity inside it aroused more interest in the children than how they leave the body.

6. These ideas show certain distortions in comparison with present physiological knowledge:

a) Functions carrying infection to the body were narrowed down to two: breathing and eating.

b) Only three organs were generally recognised as carrying germs into the body: mouth, nose, skin.

c) Of these three, the mouth was given predominance.

BIOGRAPHICAL NOTE

MARIA H. NAGY, Ph.D—1951-52 Associate Prof. of Psychology, Lynchburg College, Lynchburg, Va. 1940-48 Lecturer in Child and Applied Psychology, Pazmany University, Budapest, and part-time lecturer at Csalogany Teachers' Training College, Budapest. 1949-50, Research Assistant, Bristol University Institute of Education. 1950-51 Putnam Research Fellow for advanced research at Radcliffe College, Cambridge, Mass. Author of about 20 papers in child and general psychology.

FILMS IN UNIVERSITY EDUCATION

A Critical Analysis

By PETER N. CARDEW, M.R.C.S., L.R.C.P., A.R.P.S., A.I.B.P., *Head of Photographic Department, St. Mary's Hospital Medical School, London.*

THE Scientific Film Association have just produced a new edition of the *Catalogue of Medical Films.** The scope of this publication is very wide, ranging from films which aim to teach children the importance of correct posture to those on the technique of cup arthroplasty of the hip, from the work of a medical mission in India to high speed motion pictures of the vocal chords. The catalogue is also comprehensive in time, and contains films dating back to 1925 and those as modern as the last quarter of 1951. The only deciding factors were that the films should be of medical interest, and that they should be available for loan, hire or purchase in Britain. The publication of this list should, apart from its value as a catalogue, provide much food for thought on the part of all those concerned with the production and the consumption of medical films.

It does not require very much experience on the part of film users, to realise that the quality of medical films varies perhaps more than in any other field, and a critical user will but rarely find a film that is really satisfying. Unfortunately, this view is seldom expressed in print, and most articles which do appear are very much in the nature of propaganda tending to suggest that the film, being the most modern method of teaching, is also the most efficient, and by inference that those who ignore films are necessarily backward in their ideas and probably pigheaded into the bargain. The reason that most critics hesitate to publish their views is that it is difficult for one person to see more than a very small proportion of the available films, and thus they feel that their experience is not wide enough to warrant drawing conclusions from it. A study of the catalogue will help to overcome this state of affairs. My own knowledge, both in the production and in the use of medical films is concerned with university education, and the criticisms that I shall make, are mainly applicable to films for use in this field, though I do not doubt that the conclusions may well be applied on a much wider basis.

**To be published shortly by Harvey and Blythe Ltd., 212 Shaftesbury Avenue, W.C.2.*

How does the university lecturer fare with the available films? The catalogue has a grand total of 825 films, and of these 320 are obviously aimed primarily at the general public and are of little use to him. Thus he is left with 505 films to cover the whole field of medical science. As far as can be ascertained, at least 20% of the films were made before 1939. Although there are old films which retain teaching value, these are largely medical and surgical rarities and are few in number. Film technique has developed rapidly, and out of date methods are consequently very noticeable, and detract greatly, since they draw the students' attention away from the subject matter of the film. Thus another 100 films must be subtracted from the list of usable films. It is difficult to continue this process of elimination on an overall basis, for the various categories differ greatly, but study of some of the individual sections may illustrate the way in which other factors limit the number of usable films.

The section on General Surgery contains twenty-three films. Of these, two are aimed at the lay public, and fifteen of the remainder were made before 1939, many of them in the early thirties and even in the late twenties. This leaves six films for potential use. Now four out of these are purely operative films. These are little used in teaching for reasons that I shall discuss later. This leaves two films which have some teaching value, out of an original total of twenty-three ! This of course is a breakdown of only one section, but nevertheless there are not more than about five times this number of films available to cover the whole of surgery. It will thus be seen that the number of potentially usable films in this subject at a university level is very small. When these have been further individually criticised, a surgical teacher may find himself with less than a dozen films from which to choose. The section on General Medicine fares somewhat better. Out of nineteen films, eight remain when the popular and pre-1939 films have been excluded. I have personal knowledge of all these eight films and I think that about half of them stand a chance of being used in a lecture by a university teacher.

Having shown the paucity, on technical grounds, of films available to teachers, I shall now examine, in broad outline, the subject matter of films in the catalogue.

Table 1 shows the relative frequency of various types of films in the sections on Medicine and Surgery. The total figures do not include all the films, since many are for laymen and others could not be classified owing to lack of information. " Survey films " include all those in which the subject has been primarily a demonstration of aspects of a disease rather than those which are concerned with individual patients. These last have all been included under " case histories." In the medical section, specific methods of treatment and so called " medical operations " have been included under techniques and apparatus.

Table 1

	Medicine (*total* 58)	*Surgery* (*total* 115)
Survey films	36%	20%
Technique and Apparatus ..	17%	69% (operative)
Case histories	47%	11%
	100%	100%

Table 2

Sponsors	*Medicine* (*total* 48)	*Surgery* (*total* 100)	*Pharmacology* (*total* 31)
Government Institutions and local authorities ..	19%	5%	10%
Commercial firms ..	27%	13%	74%
Individual doctors ..	54%	82%	16%
	100%	100%	100%

Note: The figures quoted were compiled from the galley proofs of the Scientific Film Association catalogue, and it is possible that they may vary somewhat in the published edition.

Table 2 shows the subjects produced by the three main groups of sponsors. Government institutions tend to make films for general practitioners and naturally a large proportion are medical rather than surgical. The subjects are mainly treated as a survey with a view to illustrating modern trends in treatment and diagnosis. Commercial firms, the majority of which are pharmaceutical, not unnaturally sponsor films chiefly on their own products, though at the same time they are also concerned with diseases which are amenable to treatment by their own drugs. The classification " individual doctors " includes the few cases where a film has been sponsored by university departments or medical schools. It is often difficult to determine whether the authority behind such films is a doctor who gives a department as his address, or whether the film has the official sanction of the unit concerned. However, the majority included under this heading are individuals who are responsible only to themselves. If Tables 1 and 2 are compared it appears that physicians sponsor the

majority of case history films, while the surgeons favour the operation record. It is statistically incorrect to draw conclusions based on a comparison of these two tables, but a rough check through the catalogue will confirm these remarks.

Audiences

The catalogue unfortunately cannot reveal what would be the most useful information—the extent to which various films are used. I can only quote from my own experience of organising programmes and obtaining films for teaching departments. Most film showings may be divided into two groups; first, those in which a heterogeneous audience has assembled to see films as such, and second those in which films are shown during a formal lecture. It is the second group that is by far the more important in university teaching. It is somewhat depressing to compare the number of times that a film, presumably designed for undergraduates, is shown to more general audiences at congresses, medical exhibitions and society meetings in order to persuade teachers to make use of it, with the few occasions on which it is shown to undergraduates during lectures. Although the film receives favourable notices from the critics, teachers appear to avoid it. Almost invariably the error is that the audiences aimed at are too wide. A film to be used during a lecture must have no redundant material, in the form of information that is either too elementary or too advanced. A common entry in the catalogue is that a film is suitable for doctors and pharmacists. Such a film is almost certainly unsuitable for either. Quite apart from a wide difference in their basic knowledge, the psychological approach of the whole film will be incorrect if an attempt is made to satisfy both groups.

This error of producing a film which aims at too wide an audience is not only an active process but a passive one as well. Successful teaching films need a very great precision of thought and economy of design. It is only too easy for small irrelevancies to creep in, and for the producers to be influenced by critics who feel that it would be nice if such and such a fact were included, or that a general survey would help to cover the subject more completely. Each fact added is naturally of interest to someone or other, but it also renders the film slightly less useful for the teaching of a specific audience. The tendency to be too comprehensive is widespread even among those with the best of intentions.

Aim and Scope

Unfortunately many film sponsors have not, from the point of view of teaching, the best of intentions. Drug houses, who make a considerable proportion of medical films, have not as their primary intention the teaching of medicine. They make films for advertisement. This is no

criticism of the aims of drug houses, who not unnaturally have to sell their products and make money for the shareholders; but it does put them in the position of having to see a return, however indirect, for their money. Their films conform with medical ethics, the photographic standard is often very high, and to a lay critic the film appears admirable. However, they have to be made for a wide distribution and it is this that renders the bulk of them disappointing for serious teaching.

In another way physicians and surgeons are also guilty in the matter of using films for advertisement. Operative films in particular are used for self-glorification. Operative surgery is not taught in England to-day by means of films; it is taught by the practice of assisting the surgeon. Of what use, then, is the large number of films on standard operative procedures, and how often are they shown to students? Outside the showings by the maker—hardly ever. There is more justification for filming the rare and specialised operation, but even here who is the intended audience? Students and general practitioners will be interested, possibly, but hardly concerned with detailed techniques; to other surgical specialists the statement " I tie the internal carotid artery half an inch from its origin " is much more easily comprehensible and considerably shorter than a film shot, which is anyway often accompanied by a caption. Unless doctors are also teachers their films often fail to have any specific audience in view.

Another error that afflicts teaching films is that they are too long and attempt to say too much. Most of the survey films run at least thirty minutes and sometimes nearly treble this figure. As lectures last from three-quarters to one hour, this means that the teacher has to sacrifice the bulk of his time to a film—a situation which most lecturers consider undesirable. Many of these films are split up into parts, such as pathology, diagnosis, and treatment, each of them only ten minutes long, and it is a great pity that they cannot be obtained in such a form. A ten-minute film stands a good chance of being used as a summary at the end of a lecture, while the forty-minute survey will be ignored. What film makers forget is that no teacher will attempt to cover any subject such as peptic ulcers in one lecture. If the film is to cover many aspects of a disease it can only do so effectively if the scope is limited by a particular point of view.

Some Suggestions

Lastly a few positive suggestions. There ought to be films sponsored by medical schools and universities with practising teachers as advisers. It is not enough to obtain a subject expert to advise on the material to be shown. Unless he is also a teacher the result may well be wide of the mark. Furthermore the expert must have only one particular class of students in mind. A case history film made for clinical students may be of little use to

students of physiology, yet the same material edited under the direction of a physiologist will adequately serve his own teaching requirements. Thus it may be very well worth while making the same material, or parts of it, into several versions for different audiences. This might also help to spread the cost of a film over a wider audience than would otherwise be possible.

Educational films suffer from Hollywood influence. Sponsors are afflicted with the notion that there is a prestige value about a film that is lacking in other teaching methods. I believe that this leads to the production of films on many subjects which are quite unsuitable and can be much more economically demonstrated by use of the humble lantern slide or the film strip. Before embarking on the considerable expense involved, sponsors must ask themselves whether or not movement is an essential part of the subject. Orthopaedic and neurological case histories are obviously filmic, but much else turns out to be merely a succession of " stills."

A further influence of the commercial film, is the use of fancy leaders and credit titles, especially at the beginning of the films. We do not include the maker and sponsor's name on a lantern slide—why should we on what is merely an animated slide? All that is necessary is a plain title at the beginning: all other information should come at the end, and this should include the date and the medical authority responsible—anything else is merely there for advertisement. All extraneous matter only goes to make the showing of a film something of an occasion and it is just this that must be avoided. The amount of organisation required to show a film is bad enough without other distractions. Lecturers ought to be able to run a length of film with no more disturbance than if they were using a still projector to show a few slides. It is only when they can do this that many of them will consider the use of the film, which for their purpose is no more or less than is implied in the word " motion-picture."

BIOGRAPHICAL NOTES

PETER N. CARDEW, M.R.C.S., L.R.C.P., A.R.P.S., A.I.B.P.—Head of the Photographic Department, St. Mary's Hospital Medical School, London W.2. Producer of medical films for university teaching. Member of the British Medical Association film committee, and of the medical committees of the Scientific Film Association and the Institute of British Photographers.

MALCOLM DONALDSON, F.R.C.S., F.R.C.O.G.—Honorary Consulting Gynaecologist to St. Bartholomew's and Mount Vernon Hospitals. Late Director of Cancer Department, St. Bartholomew's Hospital.

THE PROBLEM OF CANCER

By MALCOLM DONALDSON, F.R.C.S., F.R.C.O.G.,
Honorary Consulting Gynaecologist, St. Bartholomew's and Mount Vernon Hospitals.

IGNORANCE among the public concerning cancer has in the past led to a great deal of unnecessary apprehension and even fear concerning the disease. This in turn has led to reluctance on the part of the patient to consult a doctor until the disease has advanced to a stage at which permanent cure is very difficult, if not impossible.

According to the Registrar General's report for 1949, there were in England and Wales 80,663 deaths due to cancer. Of these the number of males exceeded that of females by 881. This heavy mortality is well known to the public, but it is not so well known that each year in England and Wales probably more than 20,000 patients are permanently cured.

It will be as well to define what is meant by " permanent cure." If a patient is treated for cancer when the disease is in an *advanced stage*, it is very likely to reappear within one year. It may reappear at a later date, but it is uncommon for it to reappear after five years, so the accepted definition of cure is " five years without symptoms or signs after the commencement of treatment."

The Incidence of Cancer

By this is meant the number of new cases diagnosed during the year. Since cancer is not a notifiable disease it is difficult to be certain of this number, but it is probable that 110,000 is fairly near the mark. As many of these patients live more than a year, even excluding those who are permanently cured, the cancer population is much greater, and is probably about 150,000.

The number of deaths from cancer registered have so far shown an increase each year. Does this mean that there is an increase in the disease? At first sight one might say that there is no doubt about it, but it is not so simple as that, for there are several things to be considered before making any dogmatic statement. First, there is the possibility that the disease is being better diagnosed, and that some cases which in the past have been registered as deaths from heart failure or old age were really due to cancer. Again, cancer is a disease of old age, and the number of people who live to old age is rapidly increasing, because medical science is now able to

cure other diseases such as pneumonia, tuberculosis, typhoid and a host of other diseases which in the past often proved fatal. All this leads to an increase of the cancer risk population, which further complicates the figures.

Statisticians, however, take these factors into account, and the " corrected death rates for cancer " actually showed a slight decline, as far as females were concerned, between 1948 and 1949. There is however a suspicion that, after making these allowances, cancer in certain parts of the body may actually be on the increase. The one that has received most attention in the last few years is cancer of the lung. This condition is much more prevalent among men than among women, and a research team have been enquiring whether this may not be connected with smoking. The result of such enquiries, carried out on the most scientific lines, is to suggest very strongly indeed that excessive smoking *is* a factor in producing cancer of the lung. Other possible factors are also being considered, for example exhaust fumes from cars, etc. The aetiology (cause) of cancer will be discussed in a separate section.

What is the Nature of Cancer?

In order to understand this it is essential to know something about the normal process of growth and repair. The body is made up of billions of cells, which are so small that in a square inch of skin there are more than six hundred million of them. During life these cells in all parts of the body are being worn out, and as one disappears its place is taken by a deeper cell dividing into two. For instance, cells of the skin are constantly being shed from the surface, and thousands come away every time it is washed. The stimulus which causes a cell to divide when an injury occurs is known, but the controlling mechanism which regulates the number of cells which divide is not properly understood. To give a simple example—if a person falls from a bicycle and scrapes the skin of his knee, the dead and dying cells produce a chemical which stimulates the living healthy cells to divide until the whole of the injured area is healed. At present the mechanism which brings the process to an end when healing is complete is little understood. It has been shown, however, that the presence of a piece of tissue may markedly affect the development of other tissues, by the presence of substances classified as " organisers." This will be referred to under the section on Research.

This balancing mechanism between wear and repair which keeps the various parts of the body in the same shape and size is very wonderful but occasionally it breaks down locally so that more cells are produced than are worn away. In this way a " tumour " is formed. Most of these " tumours " are innocent, that is to say are *not* cancer, and as examples may be quoted warts, cysts, fibroid tumours, etc.

The cells of some tumours, however, acquire the power of penetrating and destroying the normal cells of the tissues surrounding the tumour. This destruction may be brought about in several ways. The blood supply of the normal tissue may be interfered with or destroyed, and thus the food supply cut off. Again, cancer cells are known to have a different metabolism, *i.e.*, methods of acquiring and absorbing food material, and thus can exist more easily than normal cells. After a time these cancer tumours tend to break up, and minute clumps of malignant cells break away and are carried by the lymphatics or by the blood stream to distant parts of the body, there to set up new colonies of "rebel" cells. That, then is cancer, and it can be summed up as " normal growth gone wild."

AETIOLOGY AND RESEARCH

The cause of cancer is perhaps more baffling than that of any other disease. It can be discussed under two headings: (*a*) the stimulus that sets the process in motion; (*b*) the actual malignant process, *i.e.*, why a cancer cell behaves differently from a normal cell. Perhaps a simple simile will illustrate this. Every school boy knows how he can make a gunpowder cartridge explode—he can put it in the fire, he can hit the " cap " with a nail, and if he is ingenious he can explode it electrically; but few schoolboys know the exact chemical changes which take place in the gunpowder to produce the bang.

There is a considerable amount of knowledge concerning substances that will stimulate the " malignant explosion " and may perhaps be considered as "triggers." The best known are chemicals called carcinogens of which already about 600 different types have been manufactured.

The first real evidence of the existence of such chemicals was due to two Japanese workers, who were able to produce cancers in the ears of rabbits by painting them with tar at frequent intervals for over six months. Later the chemicals in the tar which caused the cancer were discovered by workers in this country, and other allied chemicals were also found in soot, certain oils and certain dyes.

The question then arises, can such carcinogenic substances be produced under abnormal conditions in the human subject? So far no such substances have been found, but recent work suggests that it is not the actual carcinogen itself that acts as a trigger, but probably some breakdown products of the carcinogen. It will be necessary to exclude the possibility of such breakdown substances before the theory of carcinogenic chemicals in the body as a trigger can be excluded.

The evidence concerning smoking as a factor is based purely on statistics, for so far no carcinogenic substance has been found in tobacco. The ability to manufacture carcinogens is of very great importance, because

it enables the research worker to produce cancer in animals which can then be used for testing out treatments.

Another possible causation theory is the virus theory. For many years it has been known that certain diseases are due to very small particles, so small that they can be photographed only by an "electron microscope", which are on the borderline between living and dead matter. There is no doubt that cancer tumours in certain types of birds and animals contain these viruses, and if the virus is injected into other birds or animals of the same species cancer tumours result. So far there is no definite evidence of the presence of viruses in human cancer.

Milk Factor

In this connection some very interesting experiments have been carried out on mice. It is well known that by inbreeding, *i.e.*, mating brother and sister, a strain of mice can be produced after many generations nearly all of which will develop cancer. It has been found that if the new born mouse of such a strain is removed before it has had any milk from the mother, the chance of its developing cancer is very much reduced. This is undoubtedly due to the absence of a "milk factor," and this milk factor is probably a virus. Although much work is being done on this, at present there is no evidence that such a factor exists in human beings, and it is only under these very unnatural conditions of breeding that the milk factor can be obtained in mice.

It will be seen, therefore, that speaking generally there are two main theories on the causation of cancer, namely the chemical theory and the virus theory. The former is undoubtedly true under certain special conditions in human beings, and explains occupational cancers, such as mules spinner's cancer, tar-worker's cancer and others, which special precautions have now made almost a thing of the past.

Heredity

As mentioned previously, an hereditary factor can be developed by unnatural breeding in mice. At present there is no evidence that in human beings heredity plays a part, *i.e.*, there is nothing to suggest that if a parent or both parents develop cancer their offspring are more likely to have it. It has been shown, however, that in a few families there is a condition of the intestine which is inherited and that this condition (polypi of the large intestine) is likely to develop into cancer.

Control of Normal Tissue Growth

Reference has already been made to this control, and much work is being done on it. It is well known that the size of a man or woman is controlled by hormones from the pituitary gland, but it is much more

difficult to discover what constitutes the local control of cell growth.

Some interesting experiments have been carried out in this connection. If in an embryo newt the limb bud is removed and placed in contact with the embryo elsewhere, the transferred limb bud will stimulate the growth of another limb bud in an abnormal position. The same is true if other organs are used, *e.g.*, the rudimentary eye. Again if two chick embryos are cultured on top of one another, but with the axes lying at right angles to each other, two heads may be produced on the lower one. All this is brought about by substances known as " organisers." Work on organisers is continuing.

Tissue Culture

By this is meant the growing, outside the body, of cells which have been removed from a recently killed animal, and it is a means of studying many phenomena in cell growth. The cells can be seen dividing, and their movements photographed with a cine-camera. Cancer cells can also be grown in tissue cultures. It has recently been reported that if tissue cultures are kept going for many years, far longer than the normal life of the animal from which they were originally taken, in some cases the cells have turned into cancer cells.

Research on Drug Treatment

It is now well established that " hormones " have an effect on certain types of cancer, and although at present these hormones cannot be regarded as curative, they are used in advanced cases of the disease which are incurable and they have a profoundly beneficial effect. Other drugs are being investigated in the laboratories on mice, and the results give a distinct ray of hope for the future.

TREATMENT

The two treatments which have been found to be curative in thousands of cases are surgery and radiotherapy (radium and X-rays). The question of which of these treatments shall be used depends on the individual case, and the type of tumour, e.g. whether it is radiosensitive or not. In addition to these two curative treatments, hormones, as already mentioned, are now used for advanced cases.

The theory of surgery is simple, namely to cut out the tumour whilst it is still localised, but the carrying out of the operation is often achieved with considerable difficulty. The theory of radiotherapy, on the other hand, is extremely complex, and even today it is not completely understood how the rays act, but once the treatment is planned and the proper dose

of irradiation worked out, the actual giving of the treatment is comparatively simple.

Radium

Radium was discovered by Madame Curie and her equally brilliant husband. The idea of using it for cancer was due to the fact that someone, who in those days was ignorant of its properties, walked about with a small quantity in his trouser pocket. Later there appeared a reaction and peeling of the skin near the radium. This substance emits alpha particles, and beta and gamma rays. The first two can be shielded by the lead or platinum container, but the gamma rays are of very short wave length and this gives them great power of penetration. It is the gamma rays that affect the cancer cells. If after a consultation between the surgeon and the radiotherapist it is decided to use radium, a physicist works out the amount of radium to be used and the exact position in which the containers should be placed.

X-rays

These are produced by shooting " electrons " at a very great speed along a vacuum tube to hit a metal target, and from the impact X-rays are produced. The greater the voltage used, the greater the speed of the " electrons," the shorter the wave length, and the more penetrating the X-rays. For this reason machines are now being made to be worked at 15 million volts. These very penetrating rays will act deep in the body and thus reach tumours that are at present inaccessible.

Research has shown that, speaking generally, *cancer cells are more easily affected and destroyed than the normal cells.* That is the basic principle of radiotherapy. Some tumours are very " radiosensitive," and if they all were so our task would be easy. Alas, some are very little, if any, more sensitive than the surrounding normal cells. In such cases it is necessary to use very large doses, and the normal cells get damaged. This is called radio-reaction, but the patients sometimes speak of " radium burns," and quite wrongly think that a mistake has been made.

The exact action of the rays on the cancer cells is being studied in many laboratories, and methods are being tried to make the cancer cell more sensitive to the rays by giving certain drugs. To describe all the research work that is being done on radiotherapy would fill a volume.

Some Results of Treatment

As mentioned earlier, the results depend largely on the stage of the growth when treatment, by surgery and/or radiotherapy, is carried out, so that only the better results need be quoted, i.e. those obtained when the growth is still localised.

TABLE 1.

Site of cancer	*Breast*	*Uterus*	*Skin*	*Lip*	*Rectum*	*Large Bowel*	*Tongue*
Percentage Cured	78	77	98	79	75	80	40

Every statistical table of treatment proves beyond doubt the importance of the disease being diagnosed whilst the tumour is still in an early stage. In Manchester 8,508 patients suffering from all types of cancer were treated, and of the patients in whom the tumour was still in an early stage 62% were cured, but of those in whom the tumour was advanced only 16% were saved. Alas, in over half the patients treated, the growth was advanced when the patient was first seen. In another series of 41,046 collected from thirty-seven institutions in eleven different countries, in the early stage 61.0% were cured, but in the late stage only 6.5% were cured, and in this series also over half the patients had advanced tumours when treated.

DIAGNOSIS

Since diagnosis of the disease whilst the tumour is still localised is all-important, it will be useful to discuss why so many patients present themselves for treatment when the disease is far advanced. There are three possible reasons: (1) that the tumour does not give rise to any symptoms, or that they are very insidious, until it has reached an advanced stage; (2) that the medical attendant fails to diagnose the condition; (3) that the patient neglects the first symptoms through ignorance or fear, and does not seek advice. All three factors undoubtedly contribute to the large number of cases that present themselves at a late stage of the disease.

1. *The absence of symptoms, or symptoms too slight to call attention to the disease.* This is true of cancers in certain sites, e.g. cancer of the ovary, cancer of the lung. There is very little that can be done to obtain early diagnosis in the case of these silent cancers. If a simple blood test or some analogous test could be devised, then it might be possible to screen the entire population of people who are over the age of 40. So far efforts to find such a test have failed.

Much work has been done on this subject and there are two such tests, the " Polanographic serum test " and the " Huggins reaction," both of which give a high percentage of positive results in proved cases of cancer.

But they are also positive for other diseases, and sometimes negative for cancer. They cannot therefore be considered " diagnostic," but are of some value in checking the prognosis (outlook) in a patient who has been treated.

Another method has been tried, particularly in the U.S.A. and Canada, namely that every person should be examined annually in a " Detection Clinic." This in theory is excellent, but the amount of time and the number of specialists required to carry out properly such an overhaul even on one patient makes it impracticable for more than a small proportion of the whole population to undergo such an examination.

2. *Oversight on the part of the medical attendant.* Undoubtedly this happens from time to time—nobody can be infallible. When it is realised that each general practitioner sees on the average only ten cases of cancer a year, and most of these in an advanced stage, it is a surprise that there are not more mistakes. It is possible, however, to help the general practitioner by post-graduate lectures, short articles, and cinematograph films. The Ministry of Health is just completing a series of six such films, which no doubt will focus the mind of any medical man who sees them on the possibility that a patient may be suffering from the disease.

TABLE 2.

Site of cancer	*Total Mortality in England and Wales, 1949*[1]	*Average delay in seeking treatment*
Breast	7,875	6·0 months
Cervix	2,138	5·7 „
Uterus (unspecified)[2]	2,109	10·3 „
Rectum	6,371	5·6 „
Larynx	1,123	6·6 „
Buccal cavity	1,323	5·0 „
Tongue	655	5·0 „
Lip	(small mortality)	5·7 „
Skin	(„ „)	7·5 „

[1] Registrar General's Report for 1949.
[2] Probably includes carcinoma of body and a number of cases of carcinoma of cervix.

3. *Neglect of the symptoms by the patient.* However expert and alert the doctor may be at diagnosing cancer in its early stage, he can do nothing if the patient does not seek his advice. By educating the public a great deal can be done to diminish this cause of late diagnosis.

The reader may ask what evidence there is that early symptoms are neglected by the public, and what evidence exists that education will assist in diminishing this cause. The evidence concerning the first is published in Dr. Stocks' report in *Studies on Medical and Population Subjects, No.* 3 (H.M. Stationery Office). In this report are recorded the median number of months' delay between the first symptom noticed and the start of treatment, for each site, and under the names of thirty different hospitals. In Table 2 the average delay figure for all the hospitals, under each site, has been worked out.

The proof that education will help comes from Massachusetts, U.S.A., where it has been found possible in ten years to reduce the delay figure by nearly half.

CANCER EDUCATION

How can such cancer education be carried out in England? Responsibility for education of the public in all medical matters rests with the Local Health Authority, but unless there is full-hearted enthusiasm and co-operation of the public itself, cancer education will be difficult. It is suggested that this co-operation can best be attained by setting up in each area a Local Cancer Education Committee under the auspices of the Local Health Authorities. The duties of such a committee would be to organise public lectures, to distribute pamphlets, etc. It might in addition be advisable to set up a Cancer Life Saving Association, with a small fee for life membership. This would help to pay an honorarium to lecturers, etc. The expenses, however, would be negligible.

Objections to Cancer Education?

Two objections are frequently put forward, but generally by people who have not sufficiently considered the matter. The first of these is that fear and apprehension will be increased. Many medical men do not realise that apprehension already exists, in a greater or less degree, throughout the population, and if people do not talk about cancer it is *because* of that apprehension. It is doubtful if there is anybody over the age of 21, outside a lunatic asylum, who has not heard of the disease, and every year at least a quarter of a million more people come in direct contact with cancer when they are looking after a relative or a friend who is suffering from the disease. Few of these people have any real knowledge, and are apprehensive about whether it is infectious (which of course

it is not), and would undoubtedly like to ask many questions but have not the courage to do so. Talking about it is the first sign that they are conquering their apprehension. It does not need a knowledge of psychology to prove that the best way to get rid of a worry is to talk about it and " get it off one's chest." That is pure common sense.

The other objection suggests that people will flood the surgeries of the general practitioners and the hospitals. This will only happen if education is carried out by wrong methods. At the present time there are a number of people who plague their doctors, and are labelled " neurotics," on the grounds that they " do not feel very well " or have some " indefinite pain," when they really want to be told that they have no sign of cancer. Every pamphlet or leaflet should state that it is useless to go to a doctor without a real symptom, and that unless one asks about cancer one will not get an answer about cancer.

Conclusion

The solution of the cancer problem, and diminution of the high mortality, can only be brought about by greatly increased activity in a number of directions. Some results are likely to follow education of the public. This must be associated with greater facilities in many parts of the country for the immediate investigation of all suspected cases. Better treatment and new methods will under these circumstances follow almost automatically. The long term policy must be more laboratory, clinical, and statistical research.

It must not be forgotten that fear is a mental disease in itself, and that Emerson was right when he wrote

Knowledge is the antidote to fear.

Owing to the rise in the cost of printing and paper, it has unfortunately been necessary to increase the subscription rate of the *Health Education Journal*, which from this issue onwards will cost 10s. a year, 2s.9d. an issue, post free.

MILESTONES IN MEDICINE

17. The Beginnings of English Medicine.

By E. ASHWORTH UNDERWOOD, M.A., B.Sc., M.D., D.P.H., F.L.S., *Director, The Wellcome Historical Medical Museum; Hon. Lecturer, University of London.*

The beginnings of English Medicine date from the foundation of the Royal College of Physicians in 1518. The leading spirit in its inauguration was Thomas Linacre (?1460-1524). Of all the outstanding men which the Renaissance produced, few deserve greater respect than Linacre. A native of Canterbury, he became a fellow at Oxford and then spent some years searching for old manuscripts in Italy. While he was there he graduated in medicine at Padua, and on his return he lived the life of an Oxford humanist, and he also practised medicine in London. Apart from his influence on the foundation of the College, Linacre is known as one of the greatest of the classical scholars which the age produced. He published translations of six of the books of Galen and portions of the works of Aristotle. He was physician to the King, and at various times he was tutor to the royal children.

The other outstanding name associated with the foundation of the College is that of John Chambre. Like Linacre, Chambre was at first an Oxford fellow, and he then travelled in Italy. He was studying medicine at Padua almost a century before Harvey studied there. Holbein painted a well-known portrait of Chambre, and this picture is possibly the finest portrait we have of an English physician.

During the latter part of the fifteenth century England had been much torn by internal strife, and the advancement of the interests of professions was difficult. With the accession of Henry VIII more stable conditions gradually established themselves, and some of the London physicians, doubtless stimulated by Linacre, began to think of means whereby the irregular practices which were rife in their profession at that time could be curbed. In September, 1518 Henry VIII issued Letters Patent which constituted the College of Physicians, and Chambre, Linacre and Ferdinand de Victoria, all physicians to the King, were named. Four persons were to be chosen yearly to act as Censors, who were granted the power of examining candidates for admission to the College, and of regulating medicines and fining offenders. At first the jurisdiction of the

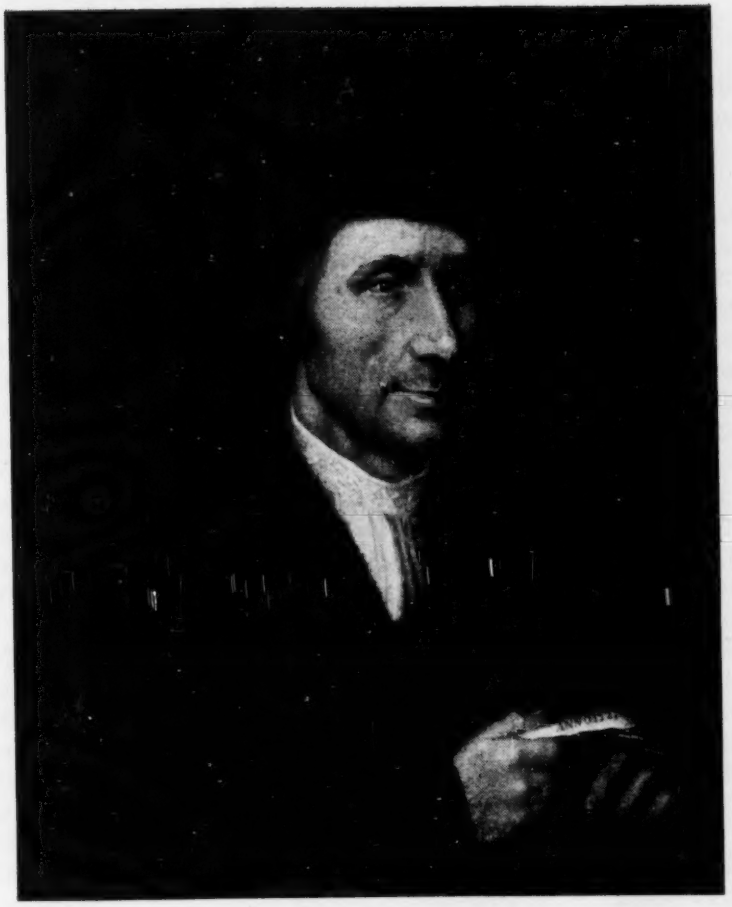
College applied only to London and to places within seven miles from it. Shortly afterwards an act was passed which gave the College power to supervise the practice of physic throughout England, except in the case of graduates of Oxford or Cambridge, who had considerable freedom.

Although Henry VIII had freely given his support and blessing to the infant college, he gave little else. Linacre was elected as the first president, and lent part of his house in Knightrider Street for the meetings of the fellows. With his friends he supplied all the funds which the College needed in its beginnings. Before his death in 1524 he presented the house to the College, and enlargements were carried out from time to time. Almost forty years after Linacre's death Queen Elizabeth gave permission for dissections to be carried out at the College. This forward step was possibly not welcomed by all the fellows, since each was called upon in turn to carry out a public dissection and to deliver lectures on anatomy. If they failed to attend they were fined. The Lumleian lectures were founded after a few years. Those who disliked giving public lectures must have breathed more freely, since the dissections were now carried out by a fellow appointed especially for the purpose. About the same time, too, the College established a physic garden, and they appointed John Gerarde, the author of the famous *Herbal*, as curator.

These steps showed increasing prosperity, and it is therefore not to be wondered at that Linacre's old house, despite the alterations which had been carried out, had now become insufficient for the demands made on it. In 1614 the College moved to new premises in Paternoster Row. In the following year William Harvey was appointed to the Lumleian Lectureship, and in the course of lectures which he gave he showed that he had already grasped the theory of the circulation of the blood which he did not publish in full until thirteen years later.

BIOGRAPHICAL NOTE

ERIC C. DOWNER, M.A., D.P.H.—Medical Officer of Health and School Medical Officer, Middlesbrough County Borough; Port Medical Officer, Tees Port Health Authority. Previously: Assistant Port Health Officer, Singapore; Surgeon Attendant, Royal Navy; M.O.H. at Chorley, Tipton, Rye, Barnsley. Author of several publications on the relation of family allowance schemes to public health (1938-39); *Chorley Borough Nutrition Service* (1939-40); *Control of Poliomyelitis in a Rural Area* (1948); *Survey of Catering Establishments, Battle and Rye* (1949).



THOMAS LINACRE (1460-1524)

A CHAPTER OF ACCIDENTS

PART I.

By ERIC C. DOWNER, M.A., D.P.H.,
Medical Officer of Health, County Borough of Middlesbrough.

ACCIDENTS today are a major and not a minor cause of ill health and death. Thanks to the discovery of new methods of treatment, the advance in chemotherapy and the use of antibiotic drugs, and to the increase in the popularity of prophylactic inoculation, there has on the other hand been a great reduction in recent years not only in the incidence of many diseases, but in the death rate from them and in the period of invalidism involved. Pari passu, however, with this great improvement in the liability of the public to sickness and to death, there has been a steady and alarming increase in the number of accidents. In each year since the war ended, an increase has been shown, and today accidents represent a major threat to the community. No authority or officer whose duty it is to safeguard or ensure the public health can afford to be indifferent to this grisly toll.

When one considers the large number of working days lost to industry and to production through absence as the result of accident, when one thinks of the large number of hospital beds occupied sometimes for many days by victims of accident, quite apart from the inconvenience of most accidents and the tragedy of fatal and disabling ones, one can see here a tremendous unnecessary dissipation of the resources of the nation, and a great loss to its industrial activity and production. To this may be added, in assessing the total loss, the very large destruction of property and of goods and chattels as a result of accidents.

The word accident covers a mighty range. A great flood in China sweeping tens of thousands of people to their death in the Yangtse Valley, the loss of a magnificent ship with hundreds drowned, the wreck of a railway train, these are examples of accidents of the magnitude of disasters. At the other end of the scale you might have something that appears almost trivial—the trifling cut, the slight burn from touching something too hot, the speck of grit that gets into one's eye. And yet, even those trivial things can lead on to serious consequences. That trivial cut could turn septic and cost a valuable life, the slight burn may, in an old and frail person result in shock and terminate a fragile life, that piece of grit may penetrate the cornea, cause an ulcer, and result in blindness.

We might define an accident as something which ought not to have happened, and broadly categorise accidents as follows:— 1. Acts of God—Violent natural phenomena, e.g. meteorite, lightning, avalanche, earthquake, typhoon. 2. Acts of man (or animal)—acts of commission and acts of omission. 3. Faults or failure of material. Of these, the two latter categories are, to a large extent, preventable, while even the incidence of the first one can be influenced.

Even violent natural phenomena conform to scientific rules which man is beginning to understand, perhaps one day to direct. Avalanche, earthquake and typhoon can generally be predicted. The area in the path of the avalanche can be evacuated, the population of an earthquake zone can take special precautions, while the path of the centre of a typhoon can be predicted and radioed, so that mariners can avoid its ambit. Many people can take shelter from lightning, or its damage can be minimised by lightning conductors, etc. Only the meteorite, hurling itself downwards without notice from the sky is, in our present state of knowledge, unavoidable.

Man can be educated to appreciate and avoid the errors both of omission and commission. Much of the problem is that of the progressive adaptation of man to his changing environment, and to the use of the tools and implements which scientific discovery is making available, and to using, for benevolent purposes, great new sources of energy and power. Man's ability and skill can be tested, and his common sense, although less easily, can be tested also. The unskilful, the foolish and the accident prone can, to a certain extent, be excluded from dangerous occupations and from opportunities of unduly risking themselves and others.

Fault or failure of material can be avoided to a great extent by good and true workmanship, and close and conscientious inspection. Where material fails, there is usually also an inspectorial or other failure on the human side.

From the point of view of the man-in-the-street, who passes along that street between his home and his work-place, accidents resolve themselves into three simple categories:— 1. Home accidents: those which occur in his residence or his garden, or in performing those simple duties necessary to his family and domestic life. 2. Accidents at or in connection with his work, and in this case one must never forget that some forms of work are per se dangerous. 3. Especially in an age of mechanical travel and of speed, there are accidents that arise from road, rail, or other forms of traffic. There are few accidents which do not fall within any of these three.

Table 1, in which an analysis has been made over a period of four years of violent deaths due to accidental cause, gives an idea of the relative preponderance of these three types of accident. It will be seen here that home accidents accounted for just over 40%; works or occupational accidents 24%; and road traffic accidents 30·1%.

Table 1

Registered Violent Deaths (1947–1950)
Middlesbrough

	1947	1948	1949	1950	*Total*	*Percentage*
Road Traffic	18	14	15	16	63	30·1%
Works (Occupation) ..	12	9	12	17	50	23·9%
Home	17	18	22	27	84	40·2%
Other	2	3	1	6	12	5·7%
TOTAL	49	44	50	66	209	100·0%

In this article I shall briefly touch on road traffic accidents, and I shall not attempt to deal with works accidents, which are largely a separate problem; but I shall concentrate on home accidents, because it is clear that there lies the greatest hope of prevention, and it is there that health authorities and their workers have a chance to bring educative influence to bear. The prevention of accidents, and of illness and death resulting therefrom, is as much the function of a health authority as the prevention of disease, infectious or other.

The accidents which are set out in the Tables that follow, and whose causes are herein analysed and commented upon, all occurred within the area of the County Borough of Middlesbrough. By the kind co-operation of the hospitals, the Police, the Fire Brigade, and others, we have been able to give a fairly complete picture of the accidents occurring in the town during recent years. Probably the only ones which we are not able to present are those which were so trivial as to require no treatment, or which were treated at home or perhaps in the surgery of the family doctor.

Road Traffic Accidents

Table 2, kindly furnished by A. E. Edwards, Esq., O.B.E., Chief Constable of Middlesbrough, surveys 7836 road traffic accidents occurring in the five years period 1946-1950. From it, the following observations could be made:—

(1) There is a smart increase in road accidents in 1949-1950, as compared with 1946-1948. Is this due to the de-rationing of petrol, and the consequent re-emergence on the roads of many old vehicles and of drivers who have not been driving for some years?

(2) Only 11·6% of the road accidents surveyed involved injury to any

Table 2

furnished by A. E. Edwards, Esq., O.B.E., Chief Constable of Middlesbrough

Road Accidents in Middlesbrough from 1946-1950

																Class of Person Killed or Injured										
Year	*Total Number*	*Accidents involving Injury*	*Persons Injured*	*Nature of Injury*			*Age Groups*						*Sex*		*Pedestrians*	*Pedal Cycle*	*Driver or Rider of*					*Passenger of*				*Dogs*
				Fatal	*Serious*	*Slight*	*under 5*	*5-15*	*16-20*	*21-45*	*46-60*	*60+*	*M.*	*F.*			*Mtr. Cycle*	*Mtr. Car*	*Gds. Veh.*	*Horse Cart*	*P.S.V.*	*Mtr. Car*	*Mtr. Cycle*	*Gds. Veh.*	
1946	1435	165	204	11	70	123	23	59	10	57	27	28	137	67	92	41	13	1	1	—	39	12	4	1	334
1947	1493	129	164	12	54	98	7	46	7	49	28	27	108	56	77	37	12	6	3	1	16	7	3	2	366
1948	1396	135	143	9	54	80	14	28	17	43	22	19	99	44	61	33	17	4	1	—	19	3	4	1	402
1949	1673	203	216	14	89	113	28	51	18	62	27	30	147	69	101	50	28	2	2	3	21	5	3	1	447
1950	1839	273	292	14	88	190	24	66	23	91	48	40	205	87	97	84	32	3	3	2	50	11	7	3	463
TOTAL	7836	905	1019	60	355	604	96	250	75	302	152	144	696	323	428	245	102	16	10	6	145	38	21	8	2012
				5.9%	34.8%	59.3%							68.3%	31.7%	42%	24%	10%	1.6%	1.0%	0.6%	14.2%	3.7%	2.1%	0.8%	

Percentage of total accidents involving injury .. 11·6%

Percentage of total injuries (a) Fatal .. .. 5·9%
(b) Serious .. .. 34·8%
(c) Slight .. .. 59·3%

Percentage of total accidents involving dogs .. 25·7%

person. In 8 cases out of 9, no injury resulted.

(3) Of the injuries, 5·9% or one in 17, proved fatal. Just over one-third were serious, while three-fifths were slight.

(4) More than twice as many males were injured as females. Males preponderate among drivers, but do they among pedestrians? This may vary according to the time of day.

(5) The highest accident rate is in the age group 5-15 (school-children), then the under-fives, and then the age group 16-20. The age group 21-45 gives the lowest average.

(6) Of the injured, pedestrians form 42%, pedal cyclists 24%, motor cyclists 10% and public service vehicle passengers 14·2% (the last figure may be illusory, as one accident to a public service vehicle may involve a lot of passengers in minor injury, e.g. by broken glass).

(7) It is note-worthy to remark that in one way or another, dogs were involved in over 25% of road traffic accidents. Middlesbrough is a very dog-minded town, and many of them run about uncontrolled. Motorists in these parts are very careful to avoid them, if possible.

Human qualities or failures:—

1. Pre-occupation, thinking, listening to wireless.
2. Inattention or carelessness, talking, pressing the wrong pedal, neglecting to give signs.
3. Failure to master mechanical device.
4. Physical defect—bad eye-sight, colour-blindness, deafness, debility, age.
5. Fatigue or exposure.
6. Alcohol or drugs.
7. Inexperience or ignorance.
8. Sheer error of judgment, e.g. of speed or distance.
9. The lust for speed.
10. Selfishness—the desire to get ahead or to jump the lights.

Defects of material:—

1. Too old a car.
2. Defective brakes.
3. Dirty windscreen or windows.
4. Smooth tyres.
5. Bad roads, bad surface, dangerous bends, too narrow, hump bridges.
6. Badly-placed warning signs.
7. Obstruction.
8. Bad lighting of car or streets.

Natural phenomena:—

1. Fog.
2. Frost and ice, snow.

(to be continued)

NUTRITION COMMENTARY

(In the following contribution to this Commentary the writer makes an anthropological approach to the problems of human nutrition; he suggests that those concerned with Health Education should take these factors more fully into consideration. Many of the points he raises are, of course, speculative; and it would be interesting to have the views of other workers in this and related scientific fields.)

THE human body is very adaptable both to variations in climate and to varieties of food; and we have to realise that it is to this original adaptability that we probably owe our success as a species. The development of Man's brain helped him to take advantage of his unusual adaptability; and he has colonised all parts of the earth. But his curious lack of specialisation came first; and it may indeed have characterised his pre-human forebears for a few million years. At all events they seem to have been fairly nimble members of the great primate stock with some ability to run, climb and clamber among rocks; they were an " all-purpose " type of mammal, and while they were less proficient in special activities than most of the mammals, they provided an organic basis for the growth of an essentially human brain and consciousness.

The " Natural Food " of Man?

It was, I think, the growth of the complex brain upon this adaptable kind of body that prevented a gradual human recourse to specialisation. The brain developed in such a way as to enable the creatures to take greater and greater advantage of their structural flexibility. Tendencies to specialisation had little or no survival value; everything was concentrated upon the exploiting of this unique power of adaptation. But the result is that any attempt to imagine what was the " natural food " of primitive man has so far been abortive. He had no natural food in the sense in which we can speak of the natural food of horses, otters or ant eaters.

The chances are that primitive men in their migrations about the planet tried most things that are edible. But how they started the process is doubtful. For by the time they were trapping mammoths and spearing

fish, they had obviously reached a relatively high level of social organisation. Even the systematic grubbing for roots needs a degree of awareness that is probably beyond the powers of a gorilla in the wild. The problem is how these primitive men managed to obtain two or three thousand calories a day without spending an incredible amount of time in consuming leaves, stalks and fruit. Apes are compelled to do so; and so at periods must our forefathers have done. But at least they were experimentalists with their food; and they were simple and unaffected enough to adopt new habits of feeding, wherever the group was sufficiently stable to allow such habits to be fixed and transmitted. There seems not the slightest evidence that men were anything but mixed feeders from the earliest time they could be called men. In this they are unlike many of the mammals; for in most of these the structure of the teeth and jaws, the digestive system and the habits of life have practically converted them into devices for extracting nourishment from special forms of plant or animal life. Their range is limited; and except for sleeping and mating their existence is almost restricted to the search for food.

Man Becomes Civilised

Because he was such a mixed feeder, Man was potentially capable of making food a secondary matter in his life. He could contrive ways of securing his daily calories in a concentrated form by the use of cultivated cereals; and he was at last able to take yet a further step—that of attaching to his food all manner of aesthetic, ethical and religious values.

By the time men were attaching these curious social values to their food, they had of course moved far along the paths of civilisation. The religious and moral ideas they have acquired about food are so varied and often so extravagant that they could scarcely have been grafted on to biological " instincts " that led men to seek out a restricted dietary. In fact, men must always in some manner have *thought* about what they were eating; and the problem is how in that case our forebears managed to think out a reasonably balanced diet. That they did so and nave survived is evident. But how did they do it?

As soon as they began to cook and preserve their food and as soon as they began to exploit one another as slaves or serfs, their very adaptability in the matter of food became less of an asset. For, having no instinct to restrain them, they could obviously condemn themselves and their fellows to most unbalanced diets; and frequently they did so. But for hundreds of centuries before they reached this stage of civilisation their choice of food was limited only by the luxuriance of nature. The problem of the food of " natural Man " has led to the conjecture that he may have possessed an awareness of his dietetic needs that has been lost among civilised adults.

Is There a Food Instinct?

This may be true, though we have no means of checking it. A few observers have thought that very young children when offered a relatively free choice of food showed a remarkable sense of what constitutes a balanced diet. What they selected was often a queer mixture of tastes to our way of thinking; but it turned out on analysis to provide all the necessary nutrients in fair proportion. This, however, tells us nothing of the motives that urged them to make their choice; and it cannot be said that the evidence is so far conclusive.

Whether or not we can gain any insight into primitive men from a study of infants, it seems difficult to discover in older children any vestige of a food instinct. Adults seem even less instinctive in their tastes. There are stories, it is true, of men deprived for some time of fresh vegetables and presumably on the verge of scurvy, who made hungrily for fruit and leafy vegetables when they had the chance. The narratives are no doubt authentic enough; but in no case is it clear that the sufferers had not some vague understanding of the relation between fresh leaves or fruit and the health of the body. Man is a perplexing animal. One would have supposed, for example, that he had some urge to prompt him to drink sufficient water; and communities exposed to tropical conditions must acquire the habit of making good the loss of water from their tissues. Yet there are cases on record of men who have allowed themselves to become dangerously " dehydrated " simply because they were not drinking enough. It is possible, indeed, that many individuals become so lazy about drinking from childhood upwards that their bodies have to adjust their internal water regulation to a constant state of slight deficiency. A strain may then be set up that has long-term effects on their health.

Primitive Wisdom

The long-term effects of a slight dietary deficiency of this kind are, however, extremely difficult to assess; and if there *are* such effects, the symptoms that emerge are likely to be so remote from the original source of the trouble that men would not immediately perceive any connection between them. On the other hand, we may be fairly sure that primitive men acquired gradually a considerable knowledge of the properties of all kinds of edible plants in the world about them. Once they had appreciated the effect of a leaf or root upon their sensations of well-being or discomfort they tended to register the fact and transmit it to others. Folk in the tribal state have usually been found by Europeans to be remarkable botanists, confused though may have been many of the inferences they drew from their experience. Thus the peoples living about the Arctic Circle have been aware for long that infusions of pine needles are specific against scurvy; and as with many other fragments of primitive

lore it seems impossible now to trace the knowledge to its origin.

But we cannot avoid the conclusion that human dietaries are in the main the outcome of thought; and since human thinking is liable to be fallacious, it may lead men astray as much in their dietaries as in other respects. Broadly speaking, men in their ancient tribal communities must have allowed for such deficiences as give rise to immediate and obvious symptoms. They could do so because they were both very experimental and very sensitive to the bodily changes that appeared to be associated with the eating of certain plants or the parts of certain animals. In most instances they would not have the slightest understanding of the physiological processes at work; but that need not have prevented them from making useful inferences. As far as I am aware, there is no reason to suppose that any of them suffered for generations from endemic deficiency states that could have been remedied through recourse to a few supplementary foods.

Hunger and Fat

What they did undoubtedly suffer from in many parts of the world were occasional droughts, shortages and " hungry seasons." Indeed, it is as well for us to realise how accustomed men have been to hunger, and to what an extent they have adjusted their mode of life to this hard fact. Like many other mammals, Man has the capacity of storing reserve calories in the form of fat; and of this valuable capacity he has always made full use. As far as one can see, peoples on a low economic level tend to store a surplus of food in the most obvious way—by eating to excess. Any windfall of nature, such as a stranded whale on the coast, will provide them with a source of food that is rapidly exhausted; and in effect the sensations of over-eating, though frequently painful, have yet so palpable a character when contrasted with the sensations of hunger that they are deemed a positive good. Civilised men scarcely realise how far their less civilised brothers have been accustomed to bodies that " inflate " and " deflate " from season to season, as the deposits of fat are laid down and then again exhausted. The mood of the people changes with the changing seasons; and to this change of mood they are acclimatised. It is not a very " rational " regimen of life; but then their control of nature is still at a low level. One might say that, if you have no safe method of storing food and preserving it from spoilage and pests, the best plan is to store it in the tissues; the only trouble is that it is a relatively inefficient method of storage, because much of the surplus food goes to waste in the process.

Have we, by the way, completely emerged from this primitive human attitude to food? Apart from the fact that Western Europe has been plagued in recent years with severe food shortages and even temporary

famines there is a tendency with many people to eat at times to excess. We know as little of the precise causes of this as we do about the precise reason why a person will occasionally attempt to live on air. Emotional factors are no doubt often involved; and it seems probable that the vague anxiety felt by primitive peoples about their next season's food supply is diverted with many of us into more personal and spiritual channels; but the outcome is the same, an urge to comfort the soul by stuffing the stomach to repletion.

This is at all events a plausible theory. But while it was biologically useful for primitive men to lay down fat as a reserve of energy, it is to-day one of the more unhealthy symptoms of an improper diet. Over feeding of this kind may once have helped to prolong lives by providing a store against the hungry seasons; in civilised communities it certainly shortens the average span of life. In other words, we have not changed our attitude to food to suit the changed conditions of our existence.

It is probable, in fact, that many of our emotional attitudes towards food were laid down in social tradition from exceedingly early times. They have become modified in the course of history; but in their basic form they have developed into a part of our common heritage. The story of all the fallacies, taboos and superstitions that have slowly encrusted the subject of food is a long and complicated one. Many of them may, no doubt, have at some time had a rational origin; others were due to a confusion of ideas. They have been hard to eradicate because their roots have become intermeshed with a mass of related and unrelated beliefs about the nature of things. This is particularly true of illiterate communities. But it is in some measure true of highly civilised peoples; and we may draw a few conclusions for the part that is played by the health educator. Let me summarise briefly what I have said.

Lesson for the Teacher

The way in which the human body and the human mind seem capable of accommodating themselves to all varieties of diet suggests that there is no " natural food " of Man. But primitive men were interested in what they ate; and it is even possible that some of the earliest rudiments of language were concerned with differentiating between what was poisonous and what was wholesome, between what made you feel good and what made you feel uncomfortable or dissatisfied. Botany is perhaps the oldest of the sciences. Thus a traditional lore would grow up that provided the small tribal communities of men with a more or less balanced dietary. It was long before food habits in a more complex society became confused in a tangle of magic and taboos. But when they did become so confused there was no reliable " instinct " in men to warn them. On the whole, however, social traditions remained valid until men began to

process their food to any extent and to restrict the free choice of their fellow men. Then trouble started; and men were exposed by their own adaptability to the risk of grave dietetic errors.

For those of us who are concerned with the teaching of better health there seem to be two lessons we must ourselves learn. If Man is as adaptable in his food habits as I believe him to be, then there is clearly no limit to the possible modification and improvement of these habits. We shall come up against no impassable barrier of instinct. Yet at the same time we must recognise that our food habits and ways of thought are frequently of long duration. They were socially conditioned in the past by men who were seriously trying to discover how they might maintain their health and vigour in a perplexing and precarious world. These men insisted strongly upon the dietaries they felt to be suitable; and some elements of their emotional beliefs have been handed down from generation to generation.

Thus, while food habits can be modified to any extent, they can in most instances be only slowly modified. New types of food may be advertised and soon adopted; but the deeper theories will persist. Our mistake lies in the assumption that a brief and brisk campaign of enlightenment will produce the results we need. We may certainly work in hope; but we must be prepared to work for generations before our hopes are realised.

The name of the *British Journal of Industrial Medicine* was incorrectly included in a reference at the end of the article " Problems of Middle Age," published in our October, 1951 issue. The reference should read:

Wallace, J. G. *A study of labour turnover in a factory in relation to age* (to be published).

The Editor offers his apologies to the author and to the Editor of the *British Journal of Industrial Medicine* for any inconvenience this error may have caused them.

BOOK REVIEWS

YOUR HEALTH by Dean Franklin Smiley, and Adrian Gordon Gould. (The Macmillan Company, New York, 1951. Pp. 555. Illus. Price 34s.)

This volume should prove of considerable use, particularly to teachers who have the duty of passing on information about to health to older pupils. Indeed, it should have a very wide appeal, as it will commend itself to all those who are interested in their own health and who have the task of passing on information on this subject to others, no matter of what age the recipients may be. It is clearly and concisely written, always interesting and well illustrated. The various chapters are of readable length, and follow on one after the other in logical sequence. As it is an American publication the contents, and especially the illustrations, have a transatlantic context. None the less, the basic principles set out in the various chapters apply in very great measure to this country.

Almost every aspect of health at any age is covered, and although some of the sections are necessarily somewhat brief, few essentials have been omitted.

British readers will probably be rather surprised at the chapter dealing with patent medicines, which clearly illustrates that this obnoxious trade is by no means confined to Great Britain. The chapter on smoking is equally interesting. The sections of the volume which deal with schools and school children will be of special interest.

The book has a useful glossary of technical terms, and an adequate index. *Your Health* is to be recommended as a book to read, as well as a valuable source of reference.

W. CLUNIE HARVEY.

SONS AND DAUGHTERS, by ROGER PILKINGTON. (George Allen and Unwin Ltd. 1951. Pp. 214. Illus. Price 18s.)

The author is anxious that the elementary facts of human genetics and embryology should be more widely known. With this end in view he has written an attractive little book intended for the general reader with no detailed knowledge of biology. Use is made of a number of ingenious analogies and there are several remarkably fine photographs.

The field covered includes the early stages of embryonic development, the elements of genetics, the principles by which one may predict whether a baby is likely to possess any of the disadvantageous genes that happen to be current in the family, and finally the prospects of bringing about improvement in the genetic endowment of future generations.

The only serious criticism that can be made of the book is that opinions are given on the mode of inheritance of various diseases. These opinions are often naive and need a great deal of qualification before they can be used for genetic prediction. Any reader seeking information about his particular case should do it through the appropriate medical channels. The family doctor will often not be expert in this field, but he should, and usually will, know where to get an expert opinion.

Apart from this the book is a good one and likely to stimulate thought and discussion on a most important subject—the planning of our children's inheritance. As knowledge of human genetics becomes available so our responsibilities to the next generation, both as individuals and as citizens, increase.

C. O. CARTER.

FILM STRIP CATALOGUE

The Central Council for Health Education will shortly produce a catalogue of all available film strips suitable for health education. Will any reader interested in receiving further details please write to

The Medical Director,
Central Council for Health Education,
Tavistock House,
Tavistock Square,
London, W.C.1.

6th to 16th
AUGUST
1952

Summer School

in

Health Education

at

St. Osyth's Training College

CLACTON - ON - SEA

Fee for Tuition and Residence

£14 14s. 0d.

Full particulars can be obtained from the Medical Director, The Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

Printed by SAWARD & COMPANY, London E.C.1.